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to diet. Whatever may be its actual purpose in nature's economy, it has a good effect whether intended or not, viz., to cause an appreciation of the "greenwood tree." After living amidst the sage for a year, an elm or an oak becomes a wonder, the giant Sequoia of California a miracle. Arboriculture, which custom has made familiar to us from childhood, becomes suddenly a mystery, and ever afterwards we cherish all trees with especial fondness, and are thankful to the kind fortune which allots us a home with other surroundings than the forlorn artemisia.

THE DRIVERS.

BY DR. G. A. PERKINS.

A VERY few hours' residence in the tropical regions of Africa brings one into a very undesirable familiarity with that extensive tribe of insects, the ants, some species of which are found in all parts of the world, but which are greatly multiplied in the tropical regions of the globe. Africa, it is believed, can boast of a greater variety than any other land. Their name here is legion. They are everywhere; out of doors and in doors; in your food and in your bed, determined to share both. They are of all sizes; some so small that they pass easily between the threads of common muslin, and even insinuate themselves into your watch as it hangs in your chamber; others measure nearly an inch in length. The habits and food of the different species differ greatly. Some, as the Termites, called White ants (which however are not true ants, but Neuropterous insects), eat vegetable matter exclusively, destroying our houses, furniture and clothing; others are carnivorous; others feed upon sugar or the sweet juices of plants. Any one of the many species, found in so great abundance,

would furnish sufficient material for months of study for the enthusiastic naturalist.

It is of one species only that I propose to speak, the Drivers (*Anomma arcens* of Westwood? Fig. 60); an insect whose life history is yet very imperfectly known, but of whose habits the dweller in the tropical regions of West Africa cannot long remain ignorant.

Fig. 60.



The Driver ants vary in size from three-quarters of an inch to one-third of an inch in length, the soldiers being the largest. They are of a glossy jet-black color, with a large head armed with exceedingly sharp, branching forceps, or mandibles, with which they seize and cut up their prey. They do not appear to have any fixed habitations, as do the Termites, but excavate the earth from between the roots of trees, and in the cavity thus formed lay their eggs and rear their young, and from which they issue in incredible numbers (literally millions of millions) to go upon their raids.

The night is chosen for their foraging expeditions. In the midst of social enjoyment the stirring announcement is made, "Here are the drivers!" and, instantly as by an electric shock, all are on the alert to escape a personal attack. Lanterns and bamboo torches are lighted, and a search made about the house to learn the direction taken by the assailants; and if in their usual numbers the house is often left to them entirely for hours. And still more unwelcome at the hour of midnight is the bleating of sheep, and cackling of hens, in the enclosure. "All hands" are awaked from their slumbers, and the whole yard lighted; the animals are released from confinement and left to take care of themselves; the fowls removed to a place of safety, if one is to be found; but if neglected and left without the chance of escape their destruction is sure.

The Drivers are alike the enemy of man and beast, though there are times when their visits are most welcome. On their approach every kind of vermin is seized with con-

sternation, and seek safety in flight. Centipedes, Cockroaches, scorpions, etc., etc., leave their hiding-places, and are seen seeking places of greater security, only to fall at last into the clutches of their relentless foe, from whom there is no escape.

An invading army could not exhibit a higher state of discipline than is seen in the movements of these insects. They enter a house usually at one point, where a strong guard is stationed to defend the pass; they then branch off right and left, and again divide, and subdivide, till the whole ground is completely covered; not an inch is left unexplored, and every crack and cranny is entered, giving but little hope of escape to any creature that may be found secreted there. Attacking their prey they plunge their forceps into it, regardless of the size or strength of their antagonist. Nothing will cause them to relax their hold. The animal or insect writhes and twists under the pain, but his case is rendered more hopeless every moment by additions to the number of his assailants; at length, when completely exhausted by struggling, he yields to his fate, and is dispatched at the victors' leisure.

The attack goes on simultaneously, in different parts of the house. Animal substance being almost exclusively the food of the Drivers an immense number of the smaller vermin that infest our dwellings are consumed by them, and some of the larger animals when confined are also destroyed by them. They have been known to attack a human being, when rendered helpless by disease, and cause his death in a few hours. It is interesting to see a band of these midnight marauders returning home from the scene of plunder on the approach of day. Issuing from the same place they entered they are each seen bearing away some trophy with them; a joint of a cockroach's leg, the body of a spider, or the larvæ of some insects, etc., are the various spoils. As the laborers pass on with their loads they are guarded by a large body of soldiers which are stationed along the sides of their

path; or, if they are to pass through a place of uncommon exposure, these soldiers form a covered passage, by standing upon each other's back and hooking their forceps together, through this arch thus formed the laborers pass in safety.

When they leave a house it must be from some signal from the leaders, as some of them are seen running from one to another evidently giving command. The retreat is made in good order; not one individual is ever left behind. They often bridge narrow streams of water when these come across their path, by going in large numbers upon a flexible plant on one side of a stream, until their weight causes it to bend to the other side. For courage and activity the soldiers have no equal; they know no fear, and when on duty they stand with their shiny black heads erect and forceps open, ready to seize on any passing animal. No horse, donkey, or dog, can be induced to cross their path, seeming to have an instinctive dread of them; and woe be to the individual, man or beast, who gets among them at night. If a twig is drawn through their ranks they instantly close their forceps upon it; and others in turn close upon their bodies and legs, till a mass of them is seen at the end of the stick looking like a bunch of curled hair.

These insects have no eyes, but their sense of smell is very acute, for if the breath be blown on them from the distance of some feet, they are instantly in motion, running to and fro with the greatest speed, evidently aware of the approach of some living being. Though at times they are of great service in ridding our houses of cockroaches and other vermin, yet, when their haunt is near, their visits are much too frequent to be tolerated. Various methods are used to get rid of them, though often with but little success. When they are in large numbers in a small space, scalding water is, perhaps, the best method. By throwing straw or other combustible material upon them, and suffering them to overrun it (which they quickly do), they may then be destroyed by applying a match to the mass. Gunpowder,

also, is sometimes used in their holes ; hot ashes, spirits of turpentine, and other articles of the same kind, are useful to turn them from their course. When a live coal is dropped in their way they immediately attack it, though hundreds may perish in doing so. They are very sensitive to the light of the sun, which is fatal to them. They seldom move during the day, and then only during cloudy days, choosing then the dark woods or thick grass. Their rate of progression is about two yards in a minute, and in their journeys from place to place they go from four to eight abreast. I have seen a stream of Drivers crossing an open path at six o'clock in the morning, and at six at night their number was undiminished. How long they had been passing before I saw them, or how long it continued, I am not able to say. Their path, from constant travel, became quite worn and smooth. The natives are very careful to remove all grass from the vicinity of their houses, as a means of keeping off these pests.

A CHAPTER ON MITES.

BY A. S. PACKARD, JR.

BUT few naturalists have busied themselves with the study of mites. The honored names of Hermann, Von Heyden, Dugés, Dujardin and Pagenstecher, Nicolet, Koch and Robin, lead the small number who have published papers in scientific journals. After these, and except an occasional note by an amateur microscopist who occasionally—not to speak too irreverently—pauses from his “diatomaniacal” studies, and looks upon a mite simply as a “microscopic object,” to be classed in his micrographic Vade Mecum with mounted specimens of sheep’s wool, and the hairs of other quadrupeds, a distorted proboscis of a fly, and podura scales, we read but little of mites and their habits. But few